Distance Education Systems: Foundations And Fundamental Concepts

byFarhad Saba, Ph. D.

Distance education is a general concept, that has its roots in general and adult education; embracing non-traditional education, and independent study. Distance education has become possible through the use of technology, starting with print and transportation, as in correspondence education, and later with electronic communication as in educational radio, instructional television, and web-based education. It, therefore, includes the discipline of educational technology.

A general introduction to the field is presented in:
Distance Education: A General Introduction.

For formal definitions of the field, as proposed by its pioneers see:

- o What is Distance Education?
- o Defining the Concepts and Terms Which Have Characterized the Field

This brief overview, and the introductory articles show distance education is a vast concept with complex interrelated fields, each of which have their own substantial theoretical, methodological and practical base. The question, then, becomes how to understand various aspects of distance education coherently and comprehensively.

The means for exploring, and understanding concepts with several interrelated parts was introduced by Ludwig Von Bertalanffy almost in the middle of the 20th century. Bertalanffy proposed the general systems theory, and its related mathematical modeling for understanding biological organisms. Soon, social scientists adopted the principle of general systems for explaining complex phenomena, with many interrelated parts.

This was a radical departure from the normal scientific method, which proposed to reduce phenomena to their constituent parts in order to understand them. In contrast, systems approach takes a holistic look at a phenomenon in order to understand not only its parts, but also the interrelation among the parts.

Reducing distance education to one line definitions, and characterizing it as a "technology," or a "method of delivery" does not do justice to the entire field. Distance education is a complex and hierarchical system of interrelated sub-systems, each of which has its own internal complexities, but in general each affect the other parts and are affected by the other parts.

- Hardware and software technologies are the base of this hierarchy. Other sub-systems include
- means of telecommunications, which put the student and the teacher in contact with each other,
- the instructional and learning subsystems which are usually defined in academic programs and courses,
- the management system which keeps the the entire enterprise together,
- the social system which provides funding, and regulates the operation of the entire enterprise and,
- the international systems, such as the world wide web, which allows people in different countries engage in teaching and learning at a global level.

It is the understanding of this entire system of interrelated sub-systems which the subject of discussion here.

Figure 1, shows the sub-systems defined here.

International Sub-system:

International institutions, governments, and individual citizens who use systems such as the telecommunication satellites, and the world wide web, for teaching and learning at a distance.

Social Sub-system:

Federal, state, and local executive, and legislative branches of the government, foundations, special interest groups, and other social institutions, which fund, regulate, and influence the operations of distance education organizations

Educational Sub-system:

Universities, K-12 schools, training departments of major corporations, training divisions of armed services, police departments, and other civil service organizations, which engage in teaching and learning at a distance.

Instructional/Learning Sub-system:

Courses, modules, learning objects, and other organized units that are specifically designed for teaching and learning.

Telecommunications Sub-system:

Local telephone loops, coaxial cable networks, radio and television transmitters, telecommunications satellites, and other means of connecting the students with the teachers, and students among themselves.

Software Sub-systems:

Course authoring and management tools, browsers, databases, and countless other types of software, such as email, chat, white board, etc. necessary for teaching and learning at a distance.

Hardware Sub-systems:

Video cameras, computers, transmitters, scanners, microphones, receivers, monitors, and other hardware necessary for producing and displaying and transmitting instructional and learning sub-systems.

This hierarchical system model serves several purposes:

It is an analytical tool to identify various sub-systems of distance education, and concentrate on a specific sub-system

It is also a design tool for identifying the sub-system under consideration

It is a conceptual tool for formulating hypotheses about its completeness, each sub-system included, and their interrelations, and test such hypothesis using systems methodology.

http://www.distance-educator.com/print_foundationsfun.html